The Entrepreneur’s Energy Solution

SELLING ENERGY TO THE UN-ELECTRIFIED

Purdue Energy Academy | June 20, 2013
A social venture differs from a commercial venture in that the venture’s main objective is to solve social problems and provide social benefits.

Founded 2010 by Steve Katsaros, Inventor
You are lucky...

others are not.
CHINA DID IT, SO CAN AFRICA & S. ASIA

Number of People without Electricity 1970-2030

![Graph showing the number of people without electricity from 1970 to 2030 for different regions including South Asia and Sub-Saharan Africa. The graph illustrates a decrease in the number of people without electricity by 2030.]
The Link between Poverty and Electricity Access

Note: Some transition economies and the OECD average are included for comparison purposes. Source: IEA analysis; income statistics from the World Bank’s World Development Indicators, 2001.
Facts in Africa

Naiorbi, Kenya

Survey 1: Migori County & Kakrao
Survey 2: Mukuru in South B.

• 1 liter kero costs 84 shillings ($0.98 usd)
• 1.5 liters per day for school children doing homework
• 1 liter kero = 2.6 kg of CO₂
<table>
<thead>
<tr>
<th></th>
<th>Lower</th>
<th>Lower-Middle</th>
<th>Upper Middle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Income</td>
<td>&lt;10,000 KSE ($116 usd)</td>
<td>10,000 – 25,000 ($116 – 292 usd)</td>
<td>25,000 – 50,000 ($292 – 584 usd)</td>
</tr>
<tr>
<td>Electric Access</td>
<td>No electricity</td>
<td>Electricity</td>
<td>Electricity</td>
</tr>
<tr>
<td>Monthly Electric</td>
<td>n/a</td>
<td>1,500 KSE (6%)</td>
<td>1,500 KSE (3%)</td>
</tr>
<tr>
<td>Monthly Kerosene</td>
<td>3,906 KSE (39%)</td>
<td>unknown</td>
<td>69%</td>
</tr>
<tr>
<td>% with electricity who use kerosene during blackouts</td>
<td></td>
<td></td>
<td>31%</td>
</tr>
<tr>
<td>% with electricity who use candles during blackouts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% who have heard of Solar lamps</td>
<td></td>
<td></td>
<td>40%</td>
</tr>
<tr>
<td>% who, after hearing about Nokero, agreed solar lamps would be cheaper</td>
<td></td>
<td></td>
<td>75%</td>
</tr>
<tr>
<td>Thought solar was too expensive without offered credit terms</td>
<td></td>
<td></td>
<td>most</td>
</tr>
</tbody>
</table>
What does Energy Poverty Look Like in the Philippines?

THE SOLAR BULB
(From Cagayan to Palawan)

The Solar Champion Film
(A Clip - Work In Progress)
134 family, 30 barangay study in Oriental Mindoro and Palawan found:

- Bring immediate help to the 16 million Filipinos live without access to electricity
- Children increased study time by 45% after switching from kerosene to solar light
- 97% of parents said their child was more motivated to learn after purchasing a solar light
- Simple way to increase Gross Domestic Product through increased working hours
- 5 million Solar Light Bulbs can create 40 million hours of light per day for: productivity, education, conversation, etc.
- When used for work, working conditions and productivity are improved
- For women and children, improved safety and security
- For the planet, this is an environmentally friendly during the night

Philippines (cont.)
Solutions presented at the P.E.A.

- Maureen McCann, Professor of Biological Sciences
- Ernest (Chip) Blatchley, Professor of Civil Engineering
- Gary Burniske, Managing Director, GSI, Purdue
- Matthew Huber, Professor of Earth, Atmospheric and Planetary Sciences, Purdue
- Leigh Raymond, Professor of Political Science, Purdue
- Pankaj Sharma, Managing Director, Purdue Energy Center & Energy Academy
- Jack Stultz, Plant Manager, Edwardsport Plant, Duke Energy
- James (Jim) Suciu, President of Global Sales and Marketing, General Electric
- Tony Denhart, Regions Manager, University Relations, General Electric
- Jun Chen, Professor of Mechanical Engineering, Purdue
- DaNel Hogan, Albert Einstein Distinguished Educator Fellow
- Nick Carpita, Professor of Botany and Plant Pathology
- Robert (Bob) Shannon, Member, Technology & Innovation Team, Siemens
- Mike Soller, Business Development Director, Private Water
<table>
<thead>
<tr>
<th>GDP/per capita</th>
<th>Definition</th>
<th>Population</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>$26k</td>
<td>Duke Energy</td>
<td>0.9 Billion</td>
<td>$25 Trillion</td>
</tr>
<tr>
<td>$5k</td>
<td>General Electric</td>
<td>0.3 Billion</td>
<td>$1.7 Trillion</td>
</tr>
<tr>
<td>$1,400</td>
<td>Shell Energy</td>
<td>2.4 Billion</td>
<td>$3.4 Trillion</td>
</tr>
<tr>
<td>$430</td>
<td>Siemens Energy Inc.</td>
<td>2.5 Billion</td>
<td>$1 Trillion</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nokero</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Technologies Discussed at P.E.A.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Applications</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel engines</td>
<td>Water pumps, Mills, Refrigeration, Lighting and communication</td>
<td>Easy maintenance, Continuous energy services (24 hours a day), Allows for income-generating activities</td>
<td>High fuel costs, Noxious and CO₂ emissions</td>
</tr>
<tr>
<td>Small biomass plants</td>
<td>Water pumps, Mills, Refrigeration, Lighting and communication</td>
<td>Allows for income-generating activities, Base load operation, continuous operation possible</td>
<td>Noxious emissions</td>
</tr>
<tr>
<td>Mini-hydro</td>
<td>Mills, Lighting, communication and other</td>
<td>Long life, high reliability, Allows for income-generating activities</td>
<td>Site-specific, Intermittent, Water availability</td>
</tr>
<tr>
<td>Wind</td>
<td>Lighting and communication, Mills, Pumps</td>
<td>No fuel cost</td>
<td>Expensive batteries, Intermittent energy services</td>
</tr>
<tr>
<td>PV/Solar</td>
<td>Basic lighting and electronic equipment</td>
<td>No fuel cost</td>
<td>High capital costs, High cost of battery replacement, Needs further R&amp;D</td>
</tr>
</tbody>
</table>

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*NOKERO*
SELLING ENERGY TO THE UN-ELECTRIFIED
The Nokero N200 is a small, lightweight, portable light, shaped like a light bulb for easy identification. The bulb hangs in the sun to charge. At night it can be hung or laid on its side.

A “pivot” feature allows users to swivel the solar panel toward the sun to maximize charge capability. The bulb can be swiveled at night to direct light where needed.

Auto-off feature – to save battery life, the bulb will not turn on until it is dark or the panel is covered.

“High” & “Low” settings allow users to choose brightness desired.

The LED lights are enclosed in the shatter resistant bulb, do not get hot, and produce a bright, even light.
Overseas Filipino Worker
Rural Entrepreneur Program
WU Corporate Social Responsibility

Market Primer
Rural Commerce

NOKERO
Market Primer (cont.) Rural Commerce (cont.)

- 16 million w/o Electricity
- 34% between ages of 0-14
- 5 million N180-Start Lights
- $2.7 usd each
- $13.5m usd for bulbs
- + $1m usd for distribution through Government Education Channel
- Total Program $14.5m usd
Rural Entrepreneur Training program

- $750 USD Cost | Profit Potential of $750
- Funded by OFW via Remittance
- Keeps Currency in the Philippines by reducing Oil

P102 - Raycel

X 24

NOKERO
Rural Entrepreneur Training program

- Entrepreneur Training & Product Roadshow
  - Sell & Service Products
  - Return the following Month
  - Collect leads and their phone numbers
- Raffle for Market Primer
Rural Entrepreneur Training program

Raffle for Market Primer
Direct Customer Training is Required
Rural Entrepreneur
Public Service Announcements

NOKERO
• Kerosene wastes money
• Consumers are already spending money on kerosene
• Solar lights are affordable
• Micro financing may be available
• Solar lights contribute to the environment
• Solar lights allow you to “go green”
• Solar lights make you look good
• Solar lights are modern
• Quality of solar lights is increasing
• Only buy solar lights with a guarantee
• Higher priced solar lights will last longer and perform better
• Solar lights are convenient and do not involve long searches for energy like firewood
• Solar lights enable you to meet your relatives, neighbors and friends
• Solar lights can add income to small businesses, shop-keepers, farmers, fishermen
• The sun gives free energy
• Solar lights are available
• Clean and maintain solar lights
• Adopt solar energy
Rural Entrepreneur
Public Service Announcements
After successful Market Primer and Rural Commerce phases
Traditional Retail & In-Country Manufacturing

we will begin to manufacture in the Philippines for Export to Nokero’s other markets

• Job Creation
• Export increases
• Etc.
Rural Entrepreneur
Traditional Retail

Eurodiya
Solar Energy Lamps

Nokero
SOLAR LED LIGHT

Rural Entrepreneur
Traditional Retail
Media

CNN

treecugger

uncrate

change.org

smartplanet

Fast Company

designboom

O Globo

Incentive

CNET News

The Saturday Post

Discovery News

Air France Magazine

Electric Supercars

Popular Mechanics

The Sydney Morning Herald

The New York Times

KansasCity.com

NOKERO
“Less talk, more action. So many ideas die in a boardroom, in endless meetings, or on a dry erase board. Talking through the company’s future is important, but you can’t let it drag on. Once a decision is made you’ve got to be fearless and move it forward. It may fail. If it does, you wipe off the dust and go out there and fail again. Keep going until you succeed.”

Steve Katsaros
steve@nokero.com
Asante Mama Credentials

• A communication program targeting women that provides:
  – Free Health Education
  – Free Entrepreneurial Education
  – Financial Literacy Training
  – Innovative products and services that lower cost of living or enhance productivity.

• Have a network of 7,000 groups in Kenya & 6,000 groups in Uganda
Video Halls

• Video Halls are ubiquitous in rural and peri-urban areas & show the latest Hollywood & Nollywood movies, sports and music videos.
• Commentators translate the dialogue to local languages.
• Have a frequency of at least 6 shows per day with an average reach of 240 customers daily.
• Ads shown before and during the movie.
• High impact due to unique branding opportunities.
• Conducive environment for dialogue.
• Audience selection based on movie.
• National Coverage
Ask for Aquido

- $7.5m usd
- Support from Minster of Education for Distribution of N180-Start to School Children
- Waiver of duties for 3 years during program
Philippines

- Crude oil - imports: 176,000 bbl/day (2009 est.)*CIA Factbook @ 97 $/bbl =
- With
Call to Action

- **Phase I**
  - Government purchase of 3 million lights at $6usd per bulb; resulting in a $/per person of $1.40usd
    - Benefits: 15 million lives improved; 45 million hours per night of light; 40*30000 120mm Liters of kerosene displaced at a yearly cost savings of $120,000,000usd

- **Phase II**
  - Manufacture in the Philippines for domestic use
    - Job creation

- **Phase III**
  - Increase manufacturing for export to Africa, South America, S.E. Asia
    - Increase Exports from PH
• Time spent gathering fuel: The widespread use of fuelwood and charcoal can result in scarcity of local supplies. This forces people – usually women and children – to spend hours gathering fuelwood and other forms of biomass further afield. In India, two to seven hours each day can be devoted to the collection of fuel for cooking. This reduces the time that people can devote to other productive activities, such as farming and education.

• Gender: 70% of all people living in poverty are women. Women place a high value on improved energy services because they are the primary users of household energy. Women are most likely to suffer the health effects of energy-inefficient appliances. Their exclusion from the decision-making process in many countries has led to the failure of many poverty alleviation programs.
BOP Opportunity

Estimated BOP market by sector

- $5 trillion
- HEALTH
- ICT
- TRANSPORTATION
- WATER
- OTHER
- ENERGY
- FOOD
- HOUSING

NOKERO
Illustrative Example of Household Fuel Transition
Africa
Population without electricity (millions)
Developing Asia
Population without electricity (millions)

- India: 293
- Bangladesh: 88
- Pakistan: 63
- Myanmar: 56
- Afghanistan: 26
- DPR Korea: 22
- Philippines: 18
- Cambodia: 16
- Thailand: 10
- Nepal: 8
- Sri Lanka: 7
- China: 5
- Others: 4
Latin America

Population without electricity (millions)

<table>
<thead>
<tr>
<th>Country</th>
<th>Population without electricity (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haiti</td>
<td>8</td>
</tr>
<tr>
<td>Peru</td>
<td>4</td>
</tr>
<tr>
<td>Guatemala</td>
<td>3</td>
</tr>
<tr>
<td>Brazil</td>
<td>3</td>
</tr>
<tr>
<td>Mexico</td>
<td>2.2</td>
</tr>
<tr>
<td>Bolivia</td>
<td>2.0</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>1.6</td>
</tr>
<tr>
<td>Honduras</td>
<td>1.5</td>
</tr>
<tr>
<td>Colombia</td>
<td>1.2</td>
</tr>
<tr>
<td>Argentina</td>
<td>1.1</td>
</tr>
</tbody>
</table>
Middle East
Population without electricity (millions)

- Yemen: 15
- Syria: 1.6
- Iran: 1.2
- Iraq: 0.6
Future Branches

Solar Products

- Lighting
  - Lamp / Lantern / Torch
  - Home-lighting
    - Street light
    - Traffic light & Blinker
    - Road stud
    - Directional sign
    - Road flasher
    - Ad board
- 2. Safety / Guidance
- Cooling
  - Fan
  - Refrigerator
  - Cooling pack
- Water processing
  - Water heater
  - Water pump
- Cooking
  - Cooker
- Energy harnessing
  - Portable power pack
- Mini-grid
  - Captive mini-grid for comm appln
  - Telecom tower
  - ATM
  - Building integrated PhotoVoltaics
  - Rooftop panel

NOKERO